APPENDIX 4.2

Louisville Metro Existing Plans, Studies, Reports, and Technical Information Summary

The following is a complete analysis/summary of land use and building codes for Louisville Metro.

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Code Summary

The following chart shows the relationship between the local development regulations and the Louisville Metro identified hazards.

	Dam Failure	Drought	Earthquake	Extreme Heat	Flood	Hailstorms	Haz-Mat	Karst/Sinkhole	Landslide	Severe Storm: Wind	Severe Winter Storm	Tornado	Wildfire
Building Code	***N***	***N***	***Y*P**	***Y***	***Y***	***Y*P**	***N***	***Y***	***Y***	***Y*P**	***Y*P**	***Y*P**	***N***
Residential Code	***N***	***N***	***Y*P**	***Y***	***Y***	***Y*P**	***N***	***Y***	***Y***	***Y*P**	***Y*P**	***Y*P**	***N***
Floodplain Ordinance	***N***	***N***	***N***	***N***	***Y*P**	***N***	***Y***	***N***	***N***	***N***	***N***	***N***	***N***
Cornerstone 2020	***N***	***N***	***N***	***N***	***Y***	***N***	***Y***	***Y***	***Y***	***N***	***N***	***Y***	***Y***
Land Development Code	***N***	***N***	***N***	***N***	***Y***	***N***	***Y***	***Y*P**	***Y*P**	***N***	***N***	***Y***	***Y*P**
Hazardous Materials Ordinance	***N***	***N***	***N***	***N***	***N***	***N***	***Y*P**	***N***	***N***	***N***	***N***	***N***	***N***

"***Y***" means that the regulation addresses at least partially the identified hazard

"***Y*P**" means that the regulation is the primary one for that hazard

"***N***" means that the regulation does not currently address the hazard

The following is a complete analysis/summary of land use and building codes for Louisville Metro.

Cornerstone 2020

Comprehensive Plan

Cornerstone 2020 is the official title of Louisville Metro's Comprehensive Plan that was adopted on June 15, 2000 by the Louisville and Jefferson County (now Louisville Metro) Planning Commission. The effective date of the plan was June 16, 2000.

KRS Chapter 100 authorizes local governments to regulate the use and development of land only after the adoption of a Comprehensive Plan, which establishes the goals, and public policies that define the governmental interest in such regulations. KRS 100 provides for a method of development of the Comprehensive Plan and prescribes that the Plan should be based on research and analysis of the community including:

1. The general distribution of past and present population and a forecast of the extent and character of future population;
2. An economic survey and analysis of the major existing public and private business activities and a forecast of future economic levels, and;
3. The nature, extent, adequacy and the needs of the community for the existing land and building use, transportation, and community facilities in terms of their general location, character and extent.

In addition to the required research component, KRS100 requires the plan to include a statement of goals and objectives and at least three plan elements: a community facilities plan element, a transportation element and a land use element. After the completion of the research and analytical work, the Planning Commission during 1996 drafted and submitted to Jefferson County and the cities within the County with zoning authority (including Louisville) a Statement of Goals and Objectives for the new Comprehensive Plan. The legislative bodies studied and adopted the goals and objectives during 1997. Two jurisdictions, Anchorage and the City of Louisville, modified the Goals and Objective originally adopted by the Planning Commission in 1996. The Planning Commission on February 19, 1998 then adopted the revised Goals and Objectives.

The final phase of the adoption of Cornerstone 2020 was the publication and adoption of the Plan Elements. These were developed and drafted to implement the goals and objectives and were the product of an extensive public review process. The draft document was the subject of a public hearing on September 30, 1999. The Planning Commission accepted the revised version of the plan elements and forwarded it to the legislative bodies for review and adoption. All 13 legislative bodies with zoning powers adopted the plan elements, which were officially adopted by the Planning Commission on June 15, 2000 as a component of the overall Cornerstone 2020 Comprehensive Plan.

Besides the three statutorily required plan elements, namely Community Form/Land Use (Guidelines 1-5), Mobility/Transportation (Guidelines 7-9) and Community Facilities (Guidelines14 and 15) the Plan contains two additional plan elements, Marketplace (Guideline 6) and Livability/Environment (Guidelines 10-13). The 15 guidelines are to be used for the assessment of proposed amendments to the Zoning District Map, Land Development Code text and the Community Form Core Graphics. They are to be regarded as fundamental planning statements and are intended to be read and applied in an interrelated manner and in conjunction with the Goals and Objectives to determine whether a proposed land use change is in agreement with the Comprehensive Plan.

Following is a summary of the Goals and Objectives, which impact hazard mitigation:

Goal B1 Flood Control and Stormwater Management

Understand and successfully manage the impacts of development on the carrying capacity of the region's river/stream corridor system.

Objectives:

B1.1 Utilize a basin-wide approach to define primary stream corridors and their watersheds to guide future land use and infrastructure development decisions.
B1.2 Support appropriate multi-purpose use of stream corridors and drainage facilities as a component of flood control, stormwater management and water quality protection strategies.
B1.3 Develop and implement standards for stormwater drainage facilities that emphasize the preservation of natural drainage features and ensure designs capable of accommodating the runoff from development upstream, assuming full urban build-out of the watershed. Standards shall be developed for both urbanized and rural/nonurban streams.
B1.4 Develop and implement countywide stormwater drainage control measures for new development that minimize off-site flooding, stream bank degradation and erosion.
B1.5 Define critical facilities and restrict their siting, as well as those facilities which store or utilize hazardous waste or materials, to locations outside the floodplain.
B1.6 Ensure that appropriate access to all development is provided during flood events.

B1.7 Prevent localized flooding caused by filling, plugging, clogging or other activities that would interfere with or reduce the natural drainage capability of a drainage way or blueline or intermittent stream.
B1.8 Encourage site design that reduces impervious surface materials and maximizes the saturation capacity of the soil in order to reduce runoff and to minimize the need for downstream system improvements necessary to contain it.

Goal B4 Wetlands

Recognize wetlands as important ecological systems that can serve a beneficial function including water quality improvement, flood control, or enhancement to resident or migratory wildlife.

Objectives:

B4.1 Inventory probable wetlands and wetland resources in Jefferson County
B4.2 Protect functional wetlands from disturbance, degradation or infringement.
B4.3 Support, where technically feasible and appropriate, the creation of wetlands as an alternative, sustainable way to address water quality problems.

Goal E1 Soil Erosion

Control soil erosion and the effects of sedimentation resulting from surface water runoff.

Objectives:

E1.1 Develop guidelines and standards to address soil erosion and sedimentation that will incorporate best management practices, provide measurable standards for stormwater quantity and quality, and establish strong deterrents to violation.

Goal E2 Natural Features and Ecosystems

Minimize the impact of changing land use on natural features and ecosystems.

Objectives:

E2.1 Utilize Site Plan Review guidelines and standards to identify the locations of and potential impacts on environmental resources, e.g. geological features, sensitive soils, steep slopes and stream corridors.
E2.2 Promote development that is sensitive to existing topography and minimizes land disturbance and major reshaping of geologic features.
E2.3 Encourage the protection of and restoration of degraded channels
E2.4 Identify development techniques and solutions that would result in no or minimal disturbance to such features.

Goal E3 Karst Features

Provide standards and guidelines for the compatibility of development within areas of karst topography to prevent property damage and loss due to subsidence, to protect groundwater quality and to prevent possible associated off-site flooding.

Objective:

E3.1 Define, identify and map karst areas within Jefferson County.

Goal E4 Steep Slopes and Sensitive Soils

Protect steep slopes and sensitive soils.

Objectives:

E4.1 Define, identify and map steep slopes and sensitive soils within Jefferson County
E4.2 Develop guidelines and standards that define and set criteria for development on hilltops and steep slopes to protect water quality and prevent siltation of drainage channels.

Goal F3 Open Space

Encourage environmentally sensitive management practices for open spaces, parks, rights-of-way and floodplains.

Objectives:

F3.1 Inventory the natural resource characteristics and attributes of parks, open spaces, floodplains and rights-of-way in Louisville and Jefferson County.
F3.2 Promote environmentally responsible design and management policies for publicly owned land.
F3.3 Promote interpretive and educational programs and facilities within the parks and open space system to foster an understanding of natural resources and processes.

Goal H4 Public Health and Safety

Incorporate land needed to protect public health and safety into the open space network.

Objectives:

H4.1 Manage floodplain areas and areas needed for stormwater management to minimize water and flood damage and to preserve open space. (See Goal B1)
H4.2 Protect steep slope areas to minimize property damage and public costs resulting from inappropriate development.

Goal I1 Community Acceptance (Greenways/Stream Corridors)

Promote long-term citizen involvement in the planning, design, implementation and management of the multi-objective stream corridor/greenway system.

Objective:

I1.1 Develop and implement strategies for public participation in the development and management of multi-objective stream corridor/greenway system in Jefferson County.

Goal I5 Liability, Safety and Security

Ensure that implementation of the multi-objective stream corridor/greenway system does not endanger of degrade public health, safety and welfare.

Objective:

I5.1 Provide a safe, secure environment for all persons using multi-objective stream corridor and greenway lands.

Goal K3 Ohio River Corridor

Recognize the Ohio River Corridor as a place where people connect to nature, in a healthy environment which sustains human needs and conserves natural resources.

Objectives:

K3.1 Identify and preserve and encourage restoration of important natural resources within the River Corridor such as wetlands, steep slopes and significant habitat.
K3.2 Mange the floodway and 100-year floodplain of the River to protect the public health, safety and welfare and to preserve open space.

Goal L1 Natural Resource Protection (Jefferson County Memorial Forest)

Protect the unique natural communities and preserve the biological diversity within the woodlands, meadows, streams and ponds of the Jefferson County Memorial Forest.

Objectives:

L1.1 Prohibit practices that fragment the forest including logging, timber stand improvement, road construction, crating new wildlife openings, excessive trail construction, cutting trees for visual purposes, etc.
L1.2 Prohibit activities incompatible with Forest restoration including grazing, off-road vehicle use, and mountain biking in non-designated areas.
L1.3 Contain high-impact recreational activities within designated areas.
L1.4 Allow low-impact recreational uses such as hiking and nature study throughout the Forest.
L1.5 Limit all access to the Forest to the minimum needed for stewardship and designated recreation.
L1.6 Limit trails to a single loop with occasional side trails to access scenic vistas or interesting non-sensitive features. All trails should be routed along topographic contours to minimize erosion and reduce cut and fill. Avoid steep slopes, erodible soils, streambeds and populations of rare or sensitive plants or animals. Design trails with input from a naturalist and a landscape architect, consistent with Trail Design, Construction and Maintenance as used by the Appalachian Trail Conference.
L1.7 Reroute trails and restore eroded areas by planting native trees, understory shrubs, and wildflowers characteristic of the forest community. Discourage new or “renegade” trails.
L1.11 Locate and correct areas of soil erosion to protect water quality.
L1.12 Develop and implement a fire management plan appropriate for specific areas including wilderness and developed areas.

Plan Elements

Guideline 5. Natural Areas and Scenic and Historic Resources

Protect natural areas, natural features and important scenic and historic resources. Locate development, whenever possible, in areas that do not have severe environmental limitations.

Intent: To guide future public and private economic development, investment, and preservation within areas identified as an important resource by the community.

Policies:

1. Natural Features. Encourage development that respects the natural features of the site through sensitive site design, avoids substantial changes to the topography and minimizes property damage and environmental degradation resulting from disturbance of natural systems.
6. Soils and Slopes. Encourage development to avoid wet or highly permeable soils, severe, steep or unstable slopes where the potential for severe erosion problems exists in order to prevent property damage and public costs associated with soil slippage and foundation failure and to minimize environmental degradation.

Guideline 10. Flooding and Stormwater

Minimize the potential for and impacts of flooding and effectively manage stormwater.

Intent: To protect the conveyance zone and maintain the hydraulic capacity of natural drainage systems and ensure that drainage designs minimize damage to streams and property from flooding and stormwater runoff.

Policies:

1. Impact to Watershed. Mitigate negative development impacts to the watershed and its capacity to transport stormwater, discouraging changes to stream channels and natural drainage features. Use, where available, MSD watershed plans as a guideline for development suitability.
2. Impact to Regulatory Floodplain. Mitigate negative development impacts to the integrity of the regulatory floodplain, encouraging patterns that minimize disturbance.
3. Impervious Surface. Minimize impervious surface area and take advantage of soil saturation capacities.
4. Floodplain Management Standards. Base floodplain management standards on a regulatory floodplain that reflects the full development potential of each watershed.
5. Blueline Streams. Protect solid blueline streams, consistent with the current floodplain management ordinance, from channelization, stripping, relocation or other alteration. Ensure a vegetative buffer for the banks of blueline streams to protect the functional integrity of the channel.
6. Compensatory Storage. Ensure that provisions are met (consistent with the current floodplain management ordinance) for compensatory storage when proposals reduce the existing storage capacity of the floodplain.
7. Accommodation of Stormwater Runoff. Ensure drainage designs capable of accommodating the runoff from development upstream, assuming a fully developed watershed.
8. Critical Facilities. Ensure, to the extent feasible, that critical facilities and those that store or use hazardous wastes are located outside the regulatory floodplain. Where essential community facilities must be located within a floodplain (e.g. pumping stations), ensure that these facilities are designed, located and operated in a manner that minimizes loss of services during flood events and limits, to the extent possible, floodplain disturbance.
9. Vehicular Access. Ensure that sufficient emergency vehicle access is provided above flood levels or that other remedial measures have been proposed to minimize potential hazards for any development that is proposed in or through the regulatory floodplain.
10. “Through” Drainage. Require that “through” drainage systems accommodate runoff based on a fully developed watershed and are calculated in a manner that is acceptable to MSD. Encourage, where feasible, that such systems take advantage of natural drainage features.
11. Stormwater Runoff. Ensure that peak stormwater runoff rates or volumes after development are consistent with regional and watershed plans or are mitigated on-site. Mitigation measures shall be implemented in a manner that is acceptable to MSD.
12. Steam Corridors. Utilize Best Management Practices (BMP’s) to preserve or restore stream banks/corridors.

Guideline 11 Water Quality

Protect water quality.

Intent: To prevent the degradation of water quality due to water pollution and erosion.

Policies:

3. Sediment and Erosion Control. Prevent erosion and control sedimentation using standards that account for varied site conditions and construction activities.
4. Stream Corridor Protection. Use appropriate water quality best management practices (BMP's) for site preparation and construction activities to protect stream corridors from sediments and pollutants.
6. Standards for Carbonate Areas. Protect carbonate areas through standards that control the type, location, design and operation of activities posing potential threats to groundwater quality and karst features in carbonate areas.
7. Protection of Carbonate Areas. Determine site susceptibility to erosion, identify the presence of carbonate conditions and features on site and their vulnerability to site disturbance, the extent of existing groundwater use and the impacts of the project on groundwater resources, flow patterns and existing and proposed drainage. Mitigate potential hazards to such systems resulting from the project.

Core Graphic 5 – Environmental Constraints

Constraints include:

- Floodplains
- Hydric Soils
- Steep Slopes
- Unstable Soils
- Unstable Soils on Steep Slopes.

Land Development Code Summary

The "Land Development Code for All of Jefferson County, Kentucky" (LDC) was adopted by the Louisville Metro Planning Commission, pursuant to KRS 100.137, and became effective in March 2003. The current LDC also includes subsequently adopted ordinances. It provides the detailed regulations for all development in Louisville Metro in conformance with the Comprehensive Plan (Cornerstone 2020). Under the LDC, Louisville Metro is vested with zoning authority for all areas of the County except for properties located within the boundary of 2nd, 3rd and 4th Class Cities. The cities which retain zoning authority are: Anchorage, Douglass Hills, Graymoor-Devondale, Hurstbourne, Indian Hills, Jeffersontown, Lyndon, Middletown, Prospect, Shively, St. Matthews, and St. Regis Park. The Louisville Metro Planning Commission reviews and makes recommendations to the cities on development proposals using the Land Development Code and Cornerstone 2020 as a guideline. All of the cities also utilize the Cornerstone 2020 as their guideline for reviewing development proposals; however, as of October 2010, three cities (Anchorage, St. Matthews, and Indian Hills) are still using the Development Code that was in effect prior to March 2003.

The LDC provides for government agency review of development plans utilizing the regulations and guidelines of the LDC in their review and approval. Agencies involved in the review of development plans include:

- Metro Planning and Design Services staff
- MSD (drainage, floodplain management, sewers, slopes, unstable soils, karst, erosion and sediment control, hazardous materials etc.)
- Inspections, Permits and Licenses
- Public Works
- Health Department
- Fire Departments
- Police Departments
- Natural Resources Conservation Service (soils, slopes, etc.)
- Air Pollution Control District
- Other agencies depending on type and location of development such as the Waterfront Development Corporation, U.S. Army Corps of Engineers, KIPDA, TARC, and Historic Preservation.

Following are specific sections of the LDC which relate to natural hazards.

Zoning Districts

W-1 – Waterfront District (flooding)

W-2 – Waterfront District (flooding)

W-3 – Waterfront District (flooding)

WRO – Waterfront Development Review Overlay District (flooding)

Chapter 3 Special Districts

Part 1. Floyds Fork Special District – New regulations are to be drafted but until then, the 1993 Floyds Fork Development Review Overlay District regulations are still in effect. The regulations provide special protection for the stream corridor to protect the quality of the natural environment. Sections with specific higher standards include:

- Stream Corridors
- Trees and Vegetation
- Drainage and Water Quality
- Hillsides
- Historic Elements
- Vistas and Appearance

Part 2. Jefferson Forest Special District – New regulations to be developed.

Part 3. Ohio River Corridor Special District – New regulations to be developed.

Part 4. Tyler Rural Settlement Special District – New regulations to be developed.

Appendix 3A Bardstown Road/Baxter Avenue Corridor Review Overlay District – Although the regulations do not specifically discuss hazards, historic preservation is strengthened in the district which could affect earthquake vulnerability particularly regarding façade preservation.

Appendix 3B Downtown Overlay District – Regulations do not specifically address hazards except potentially in Section E "Waterfront View District".

Appendix 3C Waterfront Review Overlay District – Adopted pursuant to KRS 82.660 – 82.670, the regulations require higher level review of all development within the defined area and provide for a separate review process by the Waterfront Development Corporation, the agency responsible for development of the waterfront area. Besides flooding there is one other hazard addressed by section 162.48 Design Guidelines (7) which requires all utilities to be underground (wind, tornado).

Chapter 4 Generally Applicable Development Standards

4.1.2 Factory Built Housing requires permanent attachment to permanent foundation in accordance with KRS 227.570-227.590. (wind, tornado, flooding).

Chapter 4.2 Conditional Use Permits

4.2.22 Earth Excavation, Filling and Refuse Disposal Operations – Major and 4.2.23 Earth Excavation/Fill – Minor - requires detailed plan review and approval by MSD and Planning Commission with strict environmental standards. (Flooding)

4.2.43 Potentially Hazardous or Nuisance Sites.

4.2.53 Underground Space requires certification by a Professional Engineer of adequate surface support to prevent cave-in and subsidence problems.

Part 4 Accessory Uses and Miscellaneous Standards

4.4.7 Minor Earth Excavation – requires detailed plan review by MSD and Planning Commission, an Erosion Prevention and Sediment Control permit from MSD and prohibits using contaminated and/or organic fill material. (Flooding)

Part 6 Development on Sites with Environmental Constraints provides additional standards for sites impacted by:

- Floodplain/floodway (conveyance zone)
- Waterways/wetlands
- Lakes and impoundments of one acre or greater

- Karst features
- Steep Slopes (>20%) and/or Unstable soils

Section 4.7 Development on Steep Slopes provides specific standards of sites with slopes>20% and/or with unstable soils. Requires a site analysis by a PE and specific approval by MSD and the Planning Director.

4.7.6 Provides for an independent review of the plan prepared by the developer's PE, if recommended by NRCS, MSD or the Planning Director, with the cost of the review to be paid for by the developer.

4.7.7 Allows the transfer of development activity within affected sites to areas within the site not impacted by slopes or unstable soils and allows higher density in the non-affected areas to compensate for leaving affected areas undeveloped.

Section 4.8 Waterways and Wetland Protection – regulations help reduce flooding impacts and provide environmental protection.

Section 4.9 Karst – Regulations were adopted in 2008 and covers all proposed development on karst terrain.

Appendix 4G Floodplain Management

Appendix 4H Erosion Prevention and Sediment Control – Ordinance No. 26 Series 2001, adopted 9/25/01. Chapter 159 of the Jefferson County Code of Ordinances sets requirements for plan review and permitting by MSD for land disturbing activities to control soil erosion and siltation (flooding, environmental protection).

Chapter 7 Subdivision Regulations

Section 7.5 Preliminary Subdivision Plans

7.5.40 Requires identification of areas with slopes >20% and >30%, unstable soils, streams and floodplains which provides for early assessment of the impact of the development on those areas.

Section 7.6 Construction Plans for Major Subdivisions

7.6.40 Composite Drainage Plan – required to be prepared by a Professional Engineer (flooding).

7.6.50 Plan View and Profile – must show all drainage structures, environmentally constrained areas such as steep slopes, unstable soils, wetlands, karst etc. Requires PE to design mitigation measures to be reviewed and approved by MSD, Public Works and the Planning Director.

Section 7.11 Conservation Subdivisions

7.11.6 (A) Primary Conservation Areas – identifies floodplains, alluvial areas, etc. to be conserved.

Part 8 – Minor Subdivisions

7.8.20 Minor plat must show the location of the 100-year floodplain on the property, or a note that the property is not located within the 100-year floodplain. Plat must also show any streams on the property.

Louisville Metro Floodplain Ordinance

Floodplain Regulations

The Louisville Metro area originally joined the National Flood Insurance Program (NFIP) in the late 1970's. FEMA identified five areas within Jefferson County and assigned Community ID's to:

- City of Jeffersontown, ID #210121 with a Post-FIRM date of 3/5/76
- City of Louisville, 210122, 7/17/78
- City of Shively, 210124, 8/1/78
- City of St. Matthews, 210123, 3/5/76
- Unincorporated Jefferson County, 210120 4/16/79

In 2006, as part of the adoption of a new Flood Insurance study, FEMA recognized the new Louisville Metro government structure and assigned one Community ID, 210120 to the entire Louisville Metro area.

The Post-FIRM date refers to when the community first adopted floodplain regulations and the FIRM's (Flood Insurance Rate Maps) for that community. The Corps of Engineers developed the original floodplain maps for FEMA in the early 1970's and covered only the area within each of the jurisdictions. They were prepared using different map scales and were difficult to use particularly for properties located on or near the borders of the maps. The maps were updated in 1994 by the Corps in partnership with Jefferson County, LOJIC and MSD utilizing the then new LOJIC mapping for the county and some new hydrologic and hydraulic models developed by MSD. The maps were the first approved by FEMA that were based on a local community's digital base maps. In December of 2006 revised maps for Louisville Metro developed by MSD under a grant from FEMA as part of the Cooperating Technical Partners program were approved and adopted.

The Floodplain Ordinance for Jefferson County was originally adopted in 1978 as Article 13 of the Development Code and basically met the minimum FEMA requirements (except it included a 1' freeboard requirement). The ordinance was also adopted by the four cities affected within the County. The Water Management Division of the County Public Works Department was designated as the review and approval agency for all development in the floodplain in the County (including the four cities). A separate floodplain permit was not issued at that time. Instead, Water Management approved plans and those plans became part of the building permit issued by the County or the City. Enforcement was done by the agency issuing the building permit in cooperation with Water Management. On January 1, 1987 MSD was designated the review and approval agency as part of the new stormwater management program implemented by MSD, the County and the City of Louisville. MSD continued enforcement using the process in place at that time.

The Floodplain Ordinance was revised in 1989 in order to meet new FEMA requirements and also to reflect MSD's new role in the enforcement process. The new ordinance exceeded the FEMA minimum in several areas including the 1' freeboard and a requirement to base the substantial damage/improvement calculations on the cumulative cost over the life of the structure. Jefferson County and the City of Louisville joined the Community Rating System at that time. Based on the higher regulatory standards and other programs implemented Louisville Metro is a Class 5 CRS community. This provides a 25% discount for flood insurance for properties located within the 100-year floodplain.

On September 9, 1997 Jefferson County adopted Ordinance #23, Series 1997, Chapter 157 of the Jefferson County Code of Ordinances. The ordinance was the result of a community wide effort to strengthen the floodplain regulations as a result of the impact of past flooding events in the past. In particular, the flood of March 1997 was fresh in the minds of the community when the ordinance was adopted. Besides strengthening the regulations in several important areas, the new ordinance created a floodplain permit process administered by MSD and a Floodplain Board (the MSD Board) to oversee the process. MSD staff now reviews all development plans in the floodplain, issues a specific floodplain permit and enforces the provisions of the ordinance. The Floodplain Board is responsible for enforcement and requests for appeals and variances. Appeals to the Floodplain Board's actions are to Jefferson County Circuit Court. Penalties for violation were also increased from the previous versions of the ordinance.

As part of the Floodplain Management Plan program, the local task force worked with MSD staff and the Jefferson County Attorney's office to revise the 1997 ordinance to reflect the merger of the City and County and also to implement several changes intended to enhance the enforcement process. The revised ordinance (Ordinance No. 125, Series 2005) was adopted by the Metro Council in December 2006.

It should be noted that under the State Regulations, KAR 4:060, a separate state stream construction permit is also required for all development in the floodplain. Since the Louisville Metro ordinance is stricter than the state regulations, the local permit is enforced, but the state permit must also be obtained. MSD staff and the State Division of Water have implemented a process to speed up permit approvals.

The following section is an overview of key provisions of the current ordinance which make it one of the most strict in the country:

- Fully Developed Watershed – means a condition of a watershed that most accurately reflects the ultimate land use of the watershed and its potential to cause runoff.
- Local Regulatory Floodplain – the 100-year floodplain created by using the runoff calculation from the Fully Developed Watershed.
- Local Regulatory Conveyance Zone – the area defined when the Local Regulatory Floodplain is "squeezed" to create a 1/10 of a foot rise. This is similar to, but much more restrictive than the FEMA Floodway, which is based on current runoff conditions, and a 1-foot rise.
- Floodplain Compensation – any fill in the Local Regulatory Floodplain must be compensated by excavation in the floodplain to at least a ratio of 1:1.
- Blueline Streams – no relocation, channelization, or stripping is allowed except for certain specific conditions such as highway bridge construction. A natural vegetation buffer strip of 25 feet on each side must be maintained.
- Access – for any new lot created in the floodplain, no new construction can occur unless access to the lot is available from a road which is at or above the Local Regulatory Floodplain.
- Critical Facility – facilities are defined to include hospitals, nursing homes, police and fire stations, emergency operations and facilities that store hazardous or flammable materials. New critical facilities must be located outside the Local Regulatory Floodplain, or certain other conditions must be met which assure the facility will be undamaged and functional in emergencies.
- Cumulative Substantial Improvement/Damage – based on a rolling 10-year period.

Building Codes

The currently adopted building codes effective in Louisville Metro are the 2007 Kentucky Building Code and the 2007 Kentucky Residential Code. These codes were promulgated under the Kentucky Administrative Regulations (KAR), 815 KAR 7:120 and 125, under authority of Kentucky Revised Statutes (KRS), KRS 198B.060. They are essentially the same codes as the 2006 International Building & Residential Codes modified to reference specific Kentucky conditions. The Kentucky Building Code was originally approved in 1978 and was adopted by the City of Louisville and Jefferson County in 1980 in accordance with State law. The Kentucky Building Code and Residential Code were officially re-adopted by Louisville Metro on August 12, 2004 and is Section 150.001 – .003 of the Louisville Metro Code of Ordinances.

Enforcement of the building code is the responsibility of the Louisville Metro Department of Codes and Regulations (C&R), Inspections, Permits and Licenses (IPL) Division. This department was created in 2007 by the merger of the Department of Inspections, Permits & Licenses and the Department of Planning and Design. C&R's Division of IPL is responsible for plan review, permitting and inspections throughout Louisville Metro except for the City of Jeffersontown which has a Building Department and issues its own permits. The City of Jeffersontown has also adopted and enforces the 2007 Kentucky Building Code and Residential Code.

One very important change to the KY Residential Code which was recommended as part of the Louisville Metro All Hazard Mitigation Plan as well as the Kentucky Hazard Mitigation Plan involves new requirements to strengthen the connection between the roof and walls of new construction. This change to Chapter 8 of the Residential Code was approved by the Kentucky Board of Housing & Building Construction and adopted in July 2007. The revisions increase the building's resistance to wind/tornado hazards.

Following is a summary of the chapters and sections of the building code which deal with the various hazards facing the community:

2007 Kentucky Building Code

Chapter 4 – Special Detailed Requirements Based on Use and Occupancy

- High-Rise Buildings
  - Standby Power requirements
  - Seismic Considerations
- Atriums
  - Standby power required for smoke control
- Underground Buildings
  - Standby power required
  - Emergency power system required

Chapter 6 – Types of Construction

- Combustible Materials

Chapter 7 – Fire Resistance Rated Construction

Chapter 9 – Fire Protection Systems

Chapter 10 – Means of Egress

- Illumination emergency power required

- Areas of Refuge
- Two way communication for areas of refuge
- Exterior area for assisted rescue
- Power operated doors – manual operation
- Horizontal sliding doors – manual operation
- Access-controlled egress doors – manual operation
- Panic and fire-exit hardware
- Stairway to roof
- Exit Access – number, location, travel distance and types
- Exits – Design criteria
- Assembly – exit requirements for assembly areas
- Emergency Escapes and Rescue

Chapter 14 – Exterior Walls

- Weather protection
- Structural requirements
- Flood resistance – for walls in floodplain
- Weather protection specifications
- Combustible Materials on Exterior
- Aluminum Composite Materials
    - Weather Resistance
    - Fire Resistance

Chapter 15 – Roof Assemblies and Rooftop Structures

- Weather Protection
- Performance Requirements
    - Wind Resistance
- Fire Classification
- Attachment of asphalt shingles based on wind speed
- High wind attachment of underlayment
- Ice dam protection for underlayment

Chapter 16 – Structural Design (Note- this is the key section for hazards)

- Construction Documents – requires design loads to be shown on the plans.
    - Roof live loads
    - Roof snow load
    - Wind loads
    - Earthquake Design Data
    - Flood loads
    - Special loads
- Anchorage – of roof to walls and columns
- Load Combinations
    - Special Seismic Load Combinations
- Roof Loads (wind, snow and earthquake)
- Snow Loads

Note for Jefferson County, Ground Snow Load is 15 psf, and Seismic Design Category = B)

- Wind Loads
- Rain Loads (for roofs)

- Flood Loads – applies to all structures in the floodplain, including substantial improvement and damage.
- Ice Loads
- Earthquake Loads
- Seismic Use Groups and Occupancy Importance Factors

(Groups I, II and III – hazard increases as Group increases)

- Earthquake Loads – Minimum Design
- Dynamic Analysis Procedure
- Earthquake Loads – Soil/Structure Interaction Loads
- Earthquake Loads – Design, detailing requirements and Structural Component Load Effects
- Architectural, Mechanical and Electrical Component Seismic Design Requirements
- Non-building Structures Seismic Design Requirements (Elevated tanks, towers, signs, etc.)
- Seismically Isolated Structures

Chapter 17 – Testing and Quality Assurance

- Quality Assurance for Seismic Resistance
- Quality Assurance for Wind Requirements
- Special Inspections for Seismic Resistance
- Special Testing for Seismic Resistance
- Structural Observation – must be provided for Seismic Design Categories D, E or F under certain conditions.

Chapter 18 – Soils and Foundations

- Foundation Design for Seismic Overturning
- Foundation and Soils Investigations
    - Where Required
    - Questionable Soils
    - Expansive Soils
    - Groundwater Table
    - Seismic Design Category C
    - Seismic Design Category D, E or F
- Footings and Foundations
    - Frost Penetration (24” for Louisville area)
    - Shifting or Moving Soils
- Damp-proofing and Water Proofing
- Pier and Pile Foundations
    - Seismic Design of piers or piles
- Driven Pile Foundations
    - Precast, non-pre-stressed piles
    - Seismic Reinforcement Seismic Des. Cat. C
    - Seismic Reinforcement Seismic Des. Cat D, E or F
    - Precast Pre-stressed Piles
    - Seismic Design Category C
    - Seismic Design Category D, E or F
    - Structural Steel Piles
    - Design in Seismic Design Category D, E or F
- Cast-in-place Concrete Pile Foundations
    - Reinforcement in Seismic Des. Cat. C

    - Reinforcement in Seismic Des. Cat. D, E or F
- Steel Cased Piles
    - Seismic Reinforcement in Seis. Des. Cat. C, D, E or F
- Concrete Filled Steel Pipe and Tube Piles
    - Seismic Reinforcement in Seis. Des. Cat. C, D, E or F
- Composite Piles
    - Seismic Reinforcement in Seis. Des. Cat. C, D, E or F

Chapter 19 – Concrete

- Freezing and thawing exposures
- Seismic Design Provisions

Chapter 21 – Masonry

- Seismic Design
- Design of Beams, Piers and Columns
    - Seismic Design Provisions
- Masonry Fireplaces
    - Seismic Anchorage (Seismic Design Category D)
- Masonry Heaters
    - Seismic Reinforcement
- Masonry Chimneys
    - Seismic Reinforcement

Chapter 22 – Steel

- Wind and Seismic Requirements for Light-framed, cold-formed Steel Walls
- Seismic Requirements for Structural Steel Construction
- Seismic Requirements for Composite Construction

Chapter 23 – Wood

- General Design Requirements – for walls to resist wind, seismic and other lateral loads
    - Seismic Design Category F
- Wind Provisions for Walls
- Conventional Light Frame Construction
    - Basic Wind Speed Greater than 100 mph
    - Buildings in Seismic Design Category B, C, D or E

Chapter 24 – Glass

- Wind, Snow and Dead Loads on Glass
- Safety Glazing

Chapter 27 – Electrical

- Emergency and Standby Power Systems

Chapter 30 – Elevators and Conveyance Systems

- Emergency Operations
    - Standby Power
    - Fire-fighters Emergency Operation

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Chapter 3 – Building Planning

- Wind Limitations
- Exposure (Wind) Category (70 mph)
- Seismic Provisions (Seismic Design Category B)
- Snow Loads (15 psf and Winter Design Temperature = 10^{o})
- Floodplain Construction
- Emergency Escape and Rescue Openings
- Smoke Alarms
- Flame Spread and Smoke Density
- Flood-Resistant Construction

Chapter 4 – Foundations

- Drainage – requires positive drainage away from foundation to a public drainage structure.
- Minimum Depth of Footings- based on frost depth (24" in Jefferson County)
- Foundation Waterproofing and Dampproofing
- Under Floor Space
    - Flood Resistance – Flood openings required

Chapter 5 – Floors

- Girder Spans and Header Spans –based on snow load
- Floor to Foundation or Bearing Wall Connection Requirements – based on seismic, wind speed and exposure.

Chapter 6 – Wall Construction

- Maximum Allowable Length of Wood Wall Studs – based on wind speed and seismic zone.
- Wall Bracing – based on seismic zone and wind speed.
- Steel Wall Framing
    - Wall to Foundation or Floor Connection Requirements (Steel walls) – based on seismic and wind speed.
    - Cold-Formed Steel Stud Thickness for various wall heights and steel strength – based on snow load.
    - Allowable Header Spans – based on snow load.
    - Header to King Stud Connection Requirements – based on seismic zone, wind speed and exposure.
    - Minimum Percentage of Full Height Structural Sheathing on Exterior Walls – based on wind speed and exposure.
    - High Wind Requirements (includes several figures and tables).
- General Masonry Construction
    - Seismic Requirements
    - Anchorage Requirements for Masonry Walls in Seismic Design Category A, B or C and Wind Loads < 30 psf.
- Glass Unit Masonry
    - Glass Unit Masonry Design Wind Load Resistance
- Insulating Concrete Form (ICF) Wall Construction
    - Minimum Vertical Wall Reinforcement for Flat ICF Above-grade Walls – based on wind speed

    - Minimum Vertical Wall Reinforcement for Waffle-grid ICF Above-grade Walls – based on wind speed.
    - Minimum Vertical Wall Reinforcement for Screen-grid ICF Above-grade Walls – based on wind speed.
    - Maximum Allowable Spans for ICG Lintels – based on snow load.
    - Minimum Percentage of Solid Wall Length along Exterior Wall Lines – based on wind speed.
    - Minimum Percentage of Solid Wall Length for Seismic Design Category C
- Exterior Windows and Glass Doors
    - Windborne Debris Protection – in Hurricane-prone areas

Chapter 7 – Wall Covering

- Stone and Masonry Veneer – includes seismic design criteria

Chapter 8 – Roof and Ceiling Construction

- Wood Trusses – Design drawings must show design loads including snow, wind and earthquake zones.
- Roof Tie Down – to resist wind uplift
- Rafter Spacing for Common Lumber Species- based on snow loads.
- Rafter/Ceiling Joist Heel Joint Connections – based on snow loads.
- Required Strength of Truss or Rafter Tie-Down Connections to Resist Wind Uplift Forces
- Steel Roof Framing
    - Allowable Rafter Spans – based on snow and wind loads
    - High Wind Ridge Tension Connections
    - Roof Tie Down
    - High Wind Roof Tie Down

Chapter 9 – Roof Assemblies

- Attachment of Asphalt Shingles – based on wind speed
- Ice Protection of Underlayment
- Underlayment and High Wind
- Reroofing
    - Recovery versus Replacement – requires removal of old asphalt shingles prior to replacement in areas subject to severe hail damage.
    - Hail Risk Map – Kentucky is shown in light to moderate risk area.

Chapter 10 – Chimneys and Fireplaces

- Masonry Chimneys
- General – includes seismic requirements. For Seismic Design Categories A, B or C seismic anchoring and reinforcement are <u>not</u> required.
- Seismic Reinforcing – for Seismic Des. Cat. D. <u>Not</u> required in Categories A, B or C.

Hazardous Materials Ordinance

The current Louisville Metro Hazardous Materials Ordinance was approved on July 2, 2007 as Ordinance No. 121, Series 2007 which amended and re-enacted Chapter 95 of the Louisville Metro Code of Ordinances. The purpose of the ordinance is for the protection of public health and safety through the prevention and control of hazardous materials incidents and releases and to require the timely reporting of releases. The Louisville and Jefferson County Metropolitan Sewer District was designated as the lead agency in administering the ordinance.

Haz-mat issues were recognized as being serious to the community many years ago but a series of major events in the late 1970's and early 80's, including the February 13, 1981 Old Louisville sewer explosion, heightened the awareness of the government and citizens to critical levels. It was recognized that in an industrial community hazardous materials can be found almost anywhere and releases of the materials into the environment can be deadly events. These releases can occur at almost any time, but in conjunction with another natural disaster such as a flood or earthquake the damages can multiply exponentially. Because of this, it was decided to add haz-mat to the list of hazards to be addressed as part of the Louisville Metro Multi-Hazard Plan during this 5-year update.

The following are some of the key sections of the ordinance:

Applicability – The ordinance applies to all parties who manufacture, use or store hazardous materials in quantities prescribed by the ordinance and as defined in the ordinance within Louisville Metro.

Definitions – Section 95.03 defines Hazardous Materials and refers to a number of federal regulations such as the Federal Water Pollution Act, the Clean Air Act, the Toxic Substances Control Act, CERCLA, RCRA, and SARA. This section also defines what constitutes a hazardous materials release incident.

Reportable Quantities – Section 95.04 includes the criteria for determining the quantity of hazardous materials which require reporting to MSD.

Notice and Reporting Quantities – Section 95.06 outlines the required process for reporting release incidents. It also outlines the duty to also report releases to the appropriate federal agencies.

Hazardous Materials Use and Spill Prevention Control Plan (HMPC) – Section 95.07 is a key section in the mitigation of the hazard. It defines who is required to prepare a HMPC and the requirements for what must be included in the plan. It defines the agencies that will review and approve the plan including MSD, the Public Health and Wellness Department, Fire Chief and other local agencies. It also imposes requirements for maintaining the plan, training of employees and keeping copies of the approved plan on-site.

Inspection and Investigation – Section 95.08 provides the authority for the administering agency and any responding agency to conduct periodic inspections and to conduct investigations of suspected releases.

Enforcement – Section 95.11 outlines the enforcement process in the event of a release.

Cost Recovery by Responding Agencies – Section 95.12 contains the provisions for cost recovery by MSD and any responding agencies for a haz-mat release. Appeals of cost recovery claims are covered in Section 95.14.

Appeals and Overseer Board – Section 95.13 establishes an Appeals and Overseer Board composed of representatives of industry, regulatory agencies and the general public appointed by the Mayor of Louisville Metro. It also outlines the appeals process.

Penalty – Section 95.99 contains the penalties for violations for the ordinance.